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CONTENTS

| | | | |
|--|-----|---|-----|
| A SEPTAD OF MORTALITY, <i>Arthur C. Jost, M. D., Dover, Del.</i> | 175 | ING IN DELAWARE SCHOOLS, <i>Luera E. McClure, M. D., Brandywine Sanatorium, Del.</i> | 186 |
| UNDULANT FEVER, <i>U. A. Sargent, M. D., Dover, Del.</i> | 179 | THE VALUE OF PERINATAL CARE DURING PREGNANCY, <i>John B. Derrickson, M. D., Frederick, Del.</i> | 180 |
| UNDULANT FEVER, <i>Bowland D. Hardman, B. S., Dover, Del.</i> | 181 | VITAL STATISTICS, <i>Wayl. John E. Downes, M. D., Newark, Del.</i> | 181 |
| ALUM PRECIPITATED TOXOID IN THE PREVENTION OF DIPHTHERIA, <i>Ernest F. Smith, M. D., Dover, Del.</i> | 182 | PUBLIC WORKS AND PUBLIC HEALTH AN OPPORTUNITY FOR THE MEDICAL PROFESSION, <i>Richard C. Heckett, B. S., Dover, Del.</i> | 192 |
| THE TREATMENT OF PULMONARY TUBERCULOSIS, <i>L. B. Phillips, M. D., Brandywine Sanatorium, Del.</i> | 184 | EDITORIAL | 196 |
| A PRELIMINARY REPORT OF TUBERCULIN TEST | | OBITUARY | 198 |

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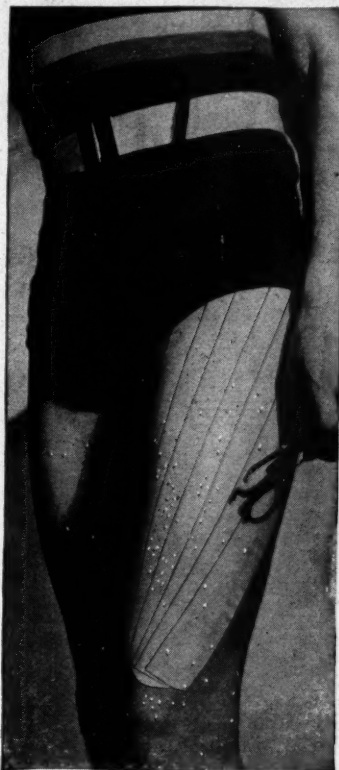
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A SEPTAD OF MORTALITY

ARTHUR C. JOST, M. D.
Dover, Del.

We praise with brief thanksgiving
Whatever Gods there be
That no man lives forever,
That dead men rise up never,
That e'en the weariest river
Winds somehow safe to sea.

That is the poet's reminder to the statistician that a definite end has been set to the reduction in mortality which all health departments have placed as their goals. Thus far can one go and no farther. The most positive and determined "we will pass" avails naught in the face of an inexorable and unalterable condition. Eventually the birth and the death rates must represent equality, and that which is given life must lose it.

There are literally thousands of causes of death, thousands of trapdoors to oblivion studding the pathway of the bridge in Mirza's vision. It may be therefore somewhat of a surprise to know that the relative importance of these exits not only varies vastly as between themselves, but have an altering and an alterable importance in years closely spaced in time. Our own records give ample opportunity for illustration.

If a selection is made of the causes of death which, in the state over a period of years, have appeared most frequently on the death certificates, it will be found that organic heart disease, Bright's disease, apoplexy, cancer, pneumonia, tuberculosis, and deaths from external causes form a septad which for each successive year over a period of years stands in undoubted prominence. The number of deaths which have occurred annually in the state since the year 1920

approximates three thousand. No fewer than from sixty to seventy per cent of all these are to be found in that group of seven diseases which head the mortality lists. The proportion, moreover, appears to be increasing, as will be seen in the following table.

| 1921 DISEASES | Population 225,000 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 358 | 159 |
| Tuberculosis | 308 | 137 |
| Apoplexy | 288 | 128 |
| Bright's Disease | 286 | 127 |
| Pneumonia | 236 | 105 |
| External Causes | 196 | 87 |
| Cancer | 176 | 78 |
| | 1848 | |
| All Deaths 2973 | Per Cent | 62 |

| 1922 DISEASES | Population 226,000 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 339 | 150 |
| Pneumonia | 285 | 126 |
| Bright's Disease | 277 | 122 |
| Apoplexy | 272 | 120 |
| Tuberculosis | 267 | 118 |
| Cancer | 211 | 94 |
| External Causes | 184 | 81 |
| | 1835 | |
| All Deaths 2987 | Per Cent | 61 |

| 1923 DISEASES | Population 227,600 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 382 | 168 |
| Pneumonia | 371 | 164 |
| Bright's Disease | 338 | 149 |
| Apoplexy | 275 | 121 |
| Tuberculosis | 259 | 114 |
| External Causes | 218 | 96 |
| Cancer | 183 | 81 |
| | 2026 | |
| All Deaths 3229 | Per Cent | 63 |

| 1924 DISEASES | Population 229,100 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 473 | 207 |
| Bright's Disease | 318 | 139 |
| Apoplexy | 287 | 125 |
| Tuberculosis | 266 | 116 |
| Pneumonia | 246 | 107 |
| External Causes | 221 | 97 |
| Cancer | 218 | 95 |
| | 2029 | |
| All Deaths 3019 | Per Cent | 67 |

| 1925 DISEASES | Population 230,600 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 523 | 226 |
| Bright's Disease | 364 | 157 |
| Apoplexy | 271 | 117 |
| Tuberculosis | 239 | 104 |
| Pneumonia | 229 | 99 |
| Cancer | 225 | 97 |
| External Causes | 186 | 81 |
| | 2037 | |
| All Deaths 3115 | Per Cent | 65 |

| 1926 DISEASES | Population 232,200 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 510 | 219 |
| Pneumonia | 379 | 164 |
| Apoplexy | 374 | 161 |
| Bright's Disease | 351 | 151 |
| Tuberculosis | 253 | 109 |
| Cancer | 235 | 101 |
| External Causes | 220 | 95 |
| | 2322 | |
| All Deaths 3449 | Per Cent | 67 |

| 1927 DISEASES | Population 233,700 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 469 | 201 |
| Apoplexy | 360 | 154 |
| Bright's Disease | 313 | 134 |
| External Causes | 237 | 102 |
| Cancer | 235 | 101 |
| Pneumonia | 231 | 99 |
| Tuberculosis | 222 | 95 |
| | 2067 | |
| All Deaths 3009 | Per Cent | 69 |

| 1928 DISEASES | Population 235,300 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 586 | 250 |
| Apoplexy | 356 | 152 |
| Bright's Disease | 280 | 119 |
| Pneumonia | 259 | 110 |
| Cancer | 245 | 104 |
| External Causes | 227 | 95 |
| Tuberculosis | 192 | 82 |
| | 2145 | |
| All Deaths 3204 | Per Cent | 67 |

| 1929 DISEASES | Population 236,800 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 507 | 215 |
| Apoplexy | 352 | 149 |
| Pneumonia | 314 | 133 |
| Bright's Disease | 282 | 119 |
| Cancer | 244 | 103 |
| External Causes | 198 | 84 |
| Tuberculosis | 193 | 82 |
| | 2090 | |
| All Deaths 3134 | Per Cent | 66 |

| 1930 DISEASES | Population 238,380 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 498 | 209 |
| Apoplexy | 357 | 150 |
| Bright's Disease | 309 | 129 |
| External Causes | 278 | 116 |
| Pneumonia | 247 | 103 |
| Cancer | 238 | 100 |
| Tuberculosis | 164 | 68 |
| | 2091 | |

| | | |
|-----------------|----------|----|
| All Deaths 3259 | Per Cent | 64 |
|-----------------|----------|----|

| 1931 DISEASES | Population 239,917 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 495 | 206 |
| Apoplexy | 327 | 136 |
| Bright's Disease | 305 | 127 |
| Pneumonia | 278 | 116 |
| Cancer | 262 | 109 |
| External Causes | 251 | 105 |
| Tuberculosis | 209 | 88 |
| | 2127 | |
| All Deaths 3306 | Per Cent | 64 |

| 1932 DISEASES | Population 241,471 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Organic Heart Disease | 386 | 160 |
| Bright's Disease | 345 | 143 |
| Apoplexy | 312 | 129 |
| Pneumonia | 294 | 122 |
| Cancer | 285 | 118 |
| External Causes | 231 | 96 |
| Tuberculosis | 168 | 70 |
| | 2021 | |
| All Deaths 3176 | Per Cent | 64 |

| 1933 DISEASES | Population 243,007 | |
|-----------------------------|-----------------------|------|
| | DEATHS | RATE |
| Bright's Disease | 440 | 181 |
| Organic Heart Disease | 425 | 175 |
| Apoplexy | 348 | 143 |
| Cancer | 305 | 125 |
| Pneumonia | 277 | 114 |
| External Causes | 217 | 90 |
| Tuberculosis | 178 | 74 |
| | 2190 | |
| All Deaths 3238 | Per Cent | 68 |

At the same time the general death rate of the state has not markedly changed. For more individuals, therefore, these seven trapdoors are yawning, or the paths of the passersby are tending to converge in certain specified directions. Even in so short a time as thirteen years there have been noticeable changes relatively in the positions of the seven. Organic heart disease, Bright's disease, deaths from violence, and especially cancer are becoming of increasing importance. One

at least, tuberculosis, shows a most material improvement and may soon have been removed from the list. Of the others, either little of definite trend is observable or there are extremely wide variations in the yearly fluctuations.

Of those becoming of increasing importance organic heart disease first deserves consideration. During a number of years there have been more deaths from that one cause than there were from two other causes of the seven taken together. It must be remembered, however, that actually a large number of diseased conditions are grouped together under the heading, organic heart disease. On this account some of the fluctuations can be ascribed to alterations either of the clerical procedure of classification or of changes in nomenclature. The latter explains to a very great extent the drop in the number of deaths reported in the past two years. During these, the latest official nomenclature of diseases was used, this superseding the older nomenclature followed since 1920. The figures are, therefore, not strictly comparable. Under the older numbers in the official nomenclature (No. 79) were grouped deaths now to be found under Nos. 92, 93, 94 and 95 in the newer classification, not all of each group, but sufficient to make an accurate comparison most difficult to obtain. Delaware's experience in 1933, during which deaths from organic heart disease dropped to second place, does not seem to conform to the experiences of a number of her sister states, which report that with them the number of deaths from heart disease still tops the lists.

It is a quite debatable question whether or not this, common though it be to the experience of a number of places, is an actual representation of the facts. Undoubtedly the death certificates filed in recent years give closer approximations to the clinical picture than did those received a decade or a score of years ago. Some are now almost uncomfortably voluminous in the detail which is imparted, approximating or in some instances actually consisting of the complete post mortem diagnosis, and naming departures from the normal in respect of a number of the vital organs. Here trouble lies in wait for the classifying staffs. There are certain cardiac

conditions which if mentioned, govern the tabulation, appropriating to themselves, so to speak, the responsibility for the death, though reasonable arguments can be advanced in support of a differing contention. One might so argue, for example, in respect of the death of one subject to some forms of myocardial disease, a broncho-pneumonia being the acute illness. Under the classifying rules the death must be called a cardiac death.

It is, therefore, quite possible that the change of place as between Bright's disease and organic heart disease which is observable in the year 1933 results from an alteration of procedure respecting tabulation. A very large number of death certificates refer both to cardiac and renal conditions. The two causes between them account for approximately one-third of all the deaths caused by the entire group of seven, or about twenty per cent of all the deaths occurring in the state. Under the newer system of classification some deaths which formerly were classified as cardiac are now attributed to a renal condition and vice versa. Under the rules now followed, for example, a death certified to be caused by cardio-vascular-renal disease is given to a renal classification, while one said to be cardio-renal only is given a heart number. If, however, the cause of death is stated to be chronic nephritis, the death is said to be due to the renal condition even if a heart lesion was named as being in existence at the same time.

The deaths from apoplexy are a fairly constant feature, third in height at the end of the period as it is at the first, if we except tuberculosis, which almost immediately thereafter gives evidence of declining importance.

Taken together the cardiac, renal and cerebral deaths form a group, in which both certification and classification are at times difficult, and which might be considered as due to developing defects in certain important mechanical processes without the proper performance of which the continuance of life is impossible. Chance in the form of a communicable disease or an undue physical exertion may have determined which, the heart, the arteries or the kidneys should first give evidence of faulty function. These are essentially the group which has carried for itself

the name of the degenerative diseases, their onset being in a way the penalty of having lived.

The place which cancer occupies in the group is somewhat unique. There is little yearly fluctuation, but almost yearly there is a rate increased over that of the former years. It has climbed steadily from the lowest position at the first of the period to the fourth at its end. With respect of this cause, at least, alteration of nomenclature or method of classification cause little difficulty, the figures being quite comparable throughout the period. There is every evidence that the rate in succeeding years will be still higher, unless in some way the trend can be arrested. How can that be done?

Of less importance than cancer, showing wider fluctuations, somewhat higher in elevation, though occupying the same relative position throughout the period are the deaths from external causes. Included in these are the deaths associated with industry and those which occur from auto accidents. The depressed economic conditions of recent years might have been expected to be a factor in the lowering of the rate, if fewer persons were during the period employed in industrial positions. Deaths from auto accidents, it would appear, must continue to increase in frequency. They numbered but 22 in 1920 as opposed to 57 in 1933. As with cancer, the height to which the rate will arise is entirely conjectural. Can supervision and instruction, the only restraining agencies, overcome the many factors which have been or will be operating towards higher rates?

The situation which pneumonia presents is as unique in its way as is that of cancer. Fifth in importance at the first of the period it was in the same relative position at the end, though in the interval there had been years marked by high fluctuations. The first and the last years appear to give what might be considered as basic or minimal rates. There were in the intervals three well marked peaks, occurring in 1923, 1926 and 1929. In each of these years influenza was present in the state to a degree in excess of its normal incidence, the experience in Delaware conforming to the experience of a number of other communities. This experience is that one

should expect minor returns of influenza in well marked waves of incidence at about three year intervals, with waves of immensely greater magnitude at intervals of twenty or more years.

What can be said respecting tuberculosis? It was second in height in 1921; it fell rapidly to become the lowest of the seven in 1927, and has maintained that position since that time. We can expect it to remain the lowest.

But—and this is the disturbing feature—for the past four years there has been little improvement. During two of the past three years there have been rates higher than those of the years immediately preceding. Must there be a readjustment of the control program, an extension of the control effort? Is the slacking up of the improvement only the result of the law of diminishing returns?

A greater number of deaths means more infection in the general population. There will thence result more deaths, and thus the disease will be perpetuated. This is an ominous prospect surely.

And what—an interesting speculation—will replace it if in the future it passes from the group? Will it be diabetes, the steady increase of which from the rate 11 to 25 is a feature of the story of the past 15 years? If the present trends are maintained, they are due to cross within the next decade.

What, we naturally ask ourselves, are the causes for and the significances of this grouping and the alterations which have developed with the years? There must be some reason for the banking up of deaths in certain classifications. If deaths occur now more frequently from certain disease there must be others of which there are relatively fewer. This is as obvious in argument as it is apparent in fact. The reduction of infant mortality which is a feature of the experience of recent years, and the diminution in the number of deaths from communicable diseases which beset the pathways of those of the younger ages, have the tendency to pass on to their destiny at later ages those from whom death has been temporarily averted. When, for these, the end comes it is apt to come from those causes which are induced by the very act of living. The machinery develops de-

fects and eventually ceases to function. Even the heart, which has been described as the greatest pump ever constructed, in time becomes overburdened and the result is inevitable.

It is easily understood, therefore, that the banking up of deaths in these classifications is closely connected with that process which for years has been going on in the state: the increasing of the average age of the population and the lengthening of the average life. An old report gives the ages of 971 residents, all who died in the city of Wilmington, in the year 1883. These persons had lived an average of 28 years only. As many of them had died in the years from infancy to the age 22 as had died in all the subsequent ages, or in other words the median age at death was that figure. At the first of the present century the figures had become 35 and 31, respectively. In 1921 the average age at death was 44 and the median age had passed that figure and was a little over 50. In the year 1933, ten years had been added to the average age at death which is now 54.9, while as many persons had died aged 63 or over as had died in all the ages under that figure.

Meanwhile a similar change was taking place in respect of the average age of the living. It cannot be expected that these figures would show as marked change as have the average ages at death. There has been, however, an actual aging of the population. The average Delawarean at the time of the 1920 census was aged about 29 years and nine months. In 1930 the average age had become about 31 years and five months, brought to that figure largely as a result of the falling birth rate and the fewer individuals in the lowest age groups.

There are implications from these conditions of the very greatest importance. Taken in conjunction with the falling birth rate and the imminence of a stationary population the national significance cannot be wholly disregarded. And, in this era of "new deals" are we far removed from the period when there must be a shifting of the preventive work in which all branches of the medical profession are engaged?

Hitherto, much of that work has been directed against the communicable diseases.

But the number of deaths which occurred in the state in 1932 from typhoid fever, measles, scarlet fever, whooping cough and diphtheria were only 39, little more than half the number of diabetes deaths, and very much below that needed to qualify for admission to the group of seven being considered.

The inference seems to be plain that here in the future more of our attention must be directed.

UNDULANT FEVER

C. A. SARGENT, M. D.

Dover, Delaware

Either undulant fever is becoming more prevalent in this State or more cases are being recognized and reported. There were two cases reported in 1931, two in 1932, six in 1933 and seven to July 1st, 1934. The first death from this cause was reported in May, 1934.

All cases reported have been investigated and histories obtained. The history of the fatal case is as follows: G. S., male, colored, age 31 years, instructor in biology. Resident of Delaware since September 1930. For several days before onset of his illness on May 14th, 1934 he was very irritable. He first complained of pains in the right side of the face and in the right arm. He had previously been told that one of his molar teeth should be extracted; thinking that the tooth was the cause of the pain, he had it extracted on May 15th. That evening he complained of intense pain in the face, neck and right arm. He was confined to bed. On May 16th he complained of being chilly and having pains in the right arm and hip and in the abdomen. He became very apprehensive. On May 17th he had chills, intense pain in the right hip and leg and did not talk unless spoken to. On May 18th a physician was consulted. At that time his temperature was 100 degrees. He had chills and said he ached all over. His right testicle was swollen and very tender. The pain continued in the hip and abdomen. On May 19th his temperature was 103. The pains and chills or chilly sensations continued. May 20th, temperature 102. Could not walk to the toilet without assistance. Symptoms continued about the same. May 21st admitted

to the hospital. Temperature 104. Severe headache, could not move his limbs without assistance. Ice bag placed on testicles. Pain severe in abdomen and right hip and leg. May 22nd, temperature normal. Symptoms remained about the same. May 23rd, ice packs on the testicles were being changed every fifteen minutes. The nurse, upon returning to the patient's room to change the ice pack, found him dead. Laboratory analysis of the patient's blood submitted on May 22nd showed positive agglutination for brucella abortus in 1 to 2560: Collodial gold on spinal fluid produced a questionable reaction in zone two. A complete post-mortem examination was not made.

Milk supply was from a thirteen-cow dairy, the entire production being used in the institution. In November 1933 the entire herd was blood tested for contagious abortion and ten were found to be positive reactors. The reactors were treated during the week of December 1st. They were again tested about December 30th and six were found to be reactors. On January 15th, 1934 they were again tested and the same six were positive. In March 1934 two of the reactors aborted. Meat and butter supply was from a national company whose products are widely used throughout the State.

This is the only malignant case reported and investigated. All other cases have had histories very similar to the following: G. M., female, white, age 30 years. First symptoms on May 1st, 1934, when she complained of feeling chilly. This condition continued at intervals until May 25th when she had definite chills. Temperature, 101 degrees. Headache and loss of appetite. May 26th, laboratory analysis showed positive agglutination for brucella abortus in 1 to 5320. Temperature range was from 100 to 102 for nine days. Temperature was normal June 3rd. No recurrence of temperature has been reported.

Of the seven cases reported to July 1st, 1934, five were from Kent County, located in Dover and the area north to the New Castle County line. Two cases were reported in Sussex County. One significant feature is that no cases have been reported among individuals using pasteurized milk.

In view of the fact that undulant fever ap-

pears to be more prevalent, the State Board of Health is undertaking a thorough investigation of the situation. Milk from all dairies, the products of which are consumed in the State, has been analyzed and approximately forty per cent have shown positive agglutination for brucella abortus. The milk from each cow in the herd at the institution in which the death occurred has been analyzed and five of the eight cows now being milked showed positive reactions. Further studies will be made of this milk to determine, by culture, the type of organism present. On June 19th another case was reported from the same institution. It is possible that this particular herd may be infected with the porcine (suis) type which is the most virulent type of brucella organisms.

The most frequent source of infection with brucella organisms is from milk or dairy products of cattle or goats.

The disease has been called brucellosis in honor of Bruce, who in 1887 recovered the coccobacillus from the spleen and called it micrococcus melotensis. In 1897 Bang recovered the "bacillus abortus" from cattle. Evans in 1918 determined that Bruce and Bang had described the same organism. Traum found the porcine (suis) type in pigs. Meyers classified the brucella organisms as melotensis (goat), abortus (cow) and suis (pig). These types are not, however, specific for these animals. The brucella abortus variety is the one most commonly found in this country. The porcine or suis variety is the most resistant and the most virulent. Brucella organisms tend to lodge in the pregnant uterus. The udder infection causes intermittent shedding of organisms and yet in appearance the cow may seem to be perfectly normal. A positive blood test indicates infection, but does not necessarily signify that the brucella organisms are being given off in the milk. To determine whether an animal is producing infected milk it is necessary to do agglutination tests on the milk. Surveys in various areas in this country indicate that from twenty-five to thirty per cent of dairy herds are infected.

There are three types of the disease all characterized by an incubation period of from six to fourteen days, onset with chills, ma-

laise, headache, loss of appetite and frequently acute sciatic pains. The most characteristic feature is the step-like rise in temperature, reaching 104 or 105 degrees by the fourth or fifth day and continuing for twelve or fifteen days without much variation. In two or three weeks there is usually a relapse, with a repetition of the fever. This condition may continue for three or four months, and in some cases as long as two years. The malignant variety may simulate typhoid fever and it frequently terminates fatally in a short time. The intermittent variety is characterized by intermittent fever over a period of several weeks or months. The ambulatory type of the disease is one in which the symptoms are almost entirely absent, and the patient may be acting as a carrier.

Diagnosis: The outstanding feature is the peculiar course of the fever, enlarged spleen, night sweats, secondary anemia, and at times, sciatic pains and orchitis. Positive diagnosis is by laboratory agglutination or isolation of the specific organism of blood culture or specific complement fixation reaction of patients' serum.

UNDULANT FEVER

ROWLAND D. HERDMAN, B. S.
Dover, Del.

Undulant fever (*brucellosis hominis*) has in all probability afflicted mankind for many centuries, but the disease was shrouded in obscurity until the discovery of micrococcus *melitensis* by Bruce in 1886. It was isolated from the spleen of patients who had died of a disease named Mediterranean or gastric fever.

Brucella abortus was first isolated and described as a bacillus by Bang, assisted by Stribolt, in 1897. They isolated the organism from fetuses and fetal membranes of cows that had aborted, and later established the fact that it was the cause of infectious abortion of cattle. The organism was later isolated from the milk of cows by Shroeder and Colton in 1911, and by Smith and Falyan in 1914. *Brucella abortus* has been found in animals in all parts of the world. It has been recovered from naturally infected horses, fowls, dogs, sheep, and wild buffalo.

Brucella suis was first isolated by Traum in 1914 from fetuses expelled prematurely from sows. The hog appears to be the true host of *brucella suis*. The other two species do not appear to infect the hog naturally, and it is very difficult to infect hogs artificially. *Brucella suis* has been isolated from the horse, the fowl, the cow, and the dog, all of which were naturally infected.

It is now a well established fact that all three species of *brucella* are pathogenic for human beings. Undulant fever may be transmitted to man by the handling of infected animals and carcasses and by the indigestion of raw dairy products which contain the living organism.

Undulant fever may be detected by the cultivation of the specific organism from the blood and urine, or by the demonstration of the specific antibodies in the serum. Because of the difficulty and uncertainty in the cultivation of the organisms, failure of the growth is of no significance. If the organism is isolated, undulant fever is certain.

Blood for culturing *brucella* may be collected at any time during the pyrexial period. *Brucella suis* and *brucella melitensis* are easily cultured from the blood of those infected. For some reason, not yet known, it is difficult to obtain *brucella abortus* from human blood. The latter species grows out very slowly, if at all, in the inoculated broth (Huddleson).

In order to obtain a culture of *brucella* from urine, the sample should be taken aseptically. The organism has been cultured but very few times from the urine of infected human beings and infected cattle. *Brucella* is easily obtained from the urine of naturally infected goats, artificially infected guinea pigs, and monkeys.

Blood for the agglutination test should not be collected until two weeks from the onset of the disease. It should be collected in the Keidel tube. The technic used by this laboratory for carrying out the agglutination test is essentially the same as that used in the United States Public Health Service Laboratory in Washington.

Preparation of Antigen. In the preparation of antigen we use the *abortus* strain supplied by the U. S. Public Health Service

Laboratory and known as 456. This antigen is grown on liver infusion agar in Blake bottles, with a hydrogen ion concentration of pH 6.8. Each bottle is seeded with the growth from glucose agar slope suspended in 2 cc of physiological salt solution. After the bottles are incubated at 37°C. for 48 hours the growth is then harvested in a small amount of physiological salt solution containing .5% carbolic acid. This stock antigen is diluted to the proper density when tests are made.

Test. The serum is separated from the clot and heated in a water-bath at 56°C. for 30 minutes. The agglutination test is carried out in test tubes 75 mm. long by 12 mm. in diameter. The serum is diluted 1:10, 1:20, etc. to 1:2560 in physiological salt solution, and .5 ml. of the various dilutions are placed in each test tube. .5 cc of antigen of a turbidity of 1,000 is added to each tube making the final dilutions from 1:20 to 1:5120. These tubes are incubated in a 55°C. water-bath for 4 hours, then they are removed to an ice chest where they are allowed to stand until the following day, when readings are made. When complete agglutination appears in 1:5120, dilutions are made still higher. A portion of the unheated serum is also tested by the Huddleson method for evidence of undulant fever.

Results. The heating of the sera in a water-bath at 56° for 30 minutes usually causes the non-specific agglutinins which occur in normal blood to disappear. If there is complete agglutination in a dilution of 1:80 or higher the specimen is reported positive. A diagnosis of undulant fever may safely be made if the clinical findings strongly support the laboratory findings.

Cows Milk. Milk is examined by agglutination test to determine whether udders of cows are infected with brucella abortus. For this test 10 ml. of milk is pipetted into a small test tube containing a pinch of rennin. This tube is placed in a slanting position in an incubator for two hours to permit the serum to separate. After serum has separated it is poured into a clean test tube. This

serum is then diluted with antigen of proper density to 1:25, 1:50, 1:100, 1:200, and 1:500, and incubated at a temperature of 37° for 24 hours. According to Torry, complete agglutination in a dilution of 1:50 or higher shows the presence of infection of udder.

During the past two months, I have examined milk from approximately all of the dealers supplying milk to the towns of this state, with exception of Wilmington, and have found a large number to be positive.

ALUM PRECIPITATED TOXOID IN THE PREVENTION OF DIPHTHERIA

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Forty years ago, before the use of antitoxin became general, diphtheria was one of the most dreaded of diseases, accompanied by a mortality of at least 30%, while the loss of life from the laryngeal form of the disease was simply appalling. While almost every remedy in the pharmacopoeia had been used in its treatment, none had been found that had any particular value.

The first attempt to use antitoxin in the cure of diphtheria in humans was made in von Bergman's clinic in 1891. The results, while encouraging, were not altogether satisfactory, owing to the fact that serums were weak, and the doses given too small. More powerful serums were made and larger doses given, so that by 1896 a marked decrease in the mortality of diphtheria was apparent where the antitoxin was being used. Since then diphtheria antitoxin has been the means of saving countless lives, and the treatment of diphtheria, instead of being a reproach to medicine, has become the model of what the treatment of an infectious disease should be.

While the morbidity statistics of the Delaware State Board of Health do not extend back far enough to give an accurate comparison of the results before and since the use of antitoxin, the following cases taken from death records in possession of the State Board of Health will give some idea of conditions then and now.

| Name | Address | Age | Date of Death | Cause of Death |
|-----------------|-------------|---------|---------------|----------------------|
| Hammond, R. | Cedar Creek | | 9-30-1891 | Malignant Diphtheria |
| " | Sallie " | | 9-30-1891 | Malignant Diphtheria |
| " | Anna " | | 9-18-1891 | Malignant Diphtheria |
| Short, Ida M. | | | 7-2-1891 | Diphtheria |
| " Luther | | | 6-29-1891 | Diphtheria |
| Mosely, William | Milton | 6 yrs. | 9-21-1888 | Diphtheria |
| " Sallie | " | 8 yrs. | 9-28-1888 | Diphtheria |
| " John W. | " | 10 yrs. | 10-2-1888 | Diphtheria |
| " Willard | " | 16 yrs. | 10-6-1888 | Diphtheria |
| " Levy | " | 18 yrs. | 10-9-1888 | Diphtheria |
| " Caroline | " | 19 yrs. | 10-12-1888 | Diphtheria |

These were all children of Hick Mosely of Milton, Delaware.

In 1913 Bela Schick discovered that toxin and antitoxin mixed might be used to produce an active immunity which was much more lasting than the passive immunity produced by antitoxin. This was largely supplanted by toxoid, which was discovered by Ramon about 1925. The great advantages claimed for it were that it did not contain any blood serum and therefore was less likely to bring about sensitization to horse serum, and that only two doses were required, instead of the three of toxin-antitoxin.

ALUM-TOXOID

As described by Wells, Graham, and Havens of Alabama State Board of Health Laboratories, the method of preparation of alum precipitated toxoid is as follows:

"To the toxoid, prepared in the usual manner, by detoxification with formaldehyde, aluminum-potassium sulphate was added until no further precipitate occurred. (This requires from 2 to 2.5% of alum). The coarse flocculent precipitate which is formed settles in a few hours, leaving a clear supernatant which is siphoned off, and an amount of 0.85% NaCl solution is then added to bring the suspension to the original volume of the whole toxoid. After vigorous shaking the precipitate is allowed to settle again, and again the supernatant is siphoned off and an equal volume of normal salt solution is added.

"In the original supernatant 60% to 70% of total nitrogen remains unprecipitated, but the determinations made after washing show

that the unwashed precipitate contains a considerable amount of protein which is not antigenic. The washing process, as a general rule, removed about 50% of the protein present in the unwashed precipitate without materially diminishing the flocculating values. The final nitrogen content of the eight lots of toxoid on which we have complete determinations of the washed precipitate varied from 13% to 20% of the amount originally present in the untreated toxoid. It is conceivable that this comparatively small protein content could materially diminish the reactions following injections. This, in fact, was found to be true both in guinea pigs and in the immunization of children."

Antigenic tests in guinea pigs indicated that a high degree of immunity is produced by a single injection of five units, resulting in protection against as much as 450 minimum lethal doses of toxin. Such a solid immunity is, of course, far beyond that resulting from a single injection of the ordinary soluble toxoid. After much experimentation on guinea pigs it was considered safe to use the product on humans.

Graham, Murphree and Gill describe their work with children as follows: "A total of 798 children have been given a single injection of alum precipitated toxoid. These may be divided for purposes of discussion into three groups. Groups 1 and 2 consisted of children of school age who were found to be strongly Schick positive and who were re-tested from two to six months after a single dose of toxoid. Group 1 received toxoid containing 10 units per cubic centimeter, while group 2 received toxoid containing 5 units per centimeter. Group 3 consisted of children who were given the one injection of toxoid (either 5 or 10 units) without a preliminary Schick test but who were tested from two to four months later. Of the 613 children in this group, 444 were in the age group 0 to 6 years.

IMMUNITY STATUS OF 798 CHILDREN FOLLOWING A SINGLE INJECTION OF PRECIPITATED TOXOID

| Group | Number of Children | Original Schick | Toxoid | Re-Schick | | Negative Per Cent |
|-------|--------------------|-----------------|-------------------|-----------|----------|-------------------|
| | | | | Positive | Negative | |
| 1 | 99 | All positive | 1 cc., 10 units | 6 | 93 | 93.9 |
| 2 | 86 | All positive | 1 cc., 5 units | 8 | 78 | 90.7 |
| 1 & 2 | 185 | All positive | 1 cc., 5-10 units | 14 | 171 | 92.4 |
| 3 | 613 | Unknown | 1 cc., 5-10 units | 21 | 592 | 96.57 |

"The results of immunization of children indicate clearly that a single injection of the alum precipitated toxoid results in immunity in a high percentage of cases. A single injection appears to be as effective as two or three injections of the best unprecipitated toxoid. The group of children who are known to have been strongly Schick positive prior to the injection of toxoid yielded 92.4 per cent completely Schick negative results from two to six months later. While the immunity status of group 3 was not known before the administration of the toxoid, the important fact, from a practical standpoint of mass immunization against diphtheria, is that one may expect at least 95 per cent immunity following a single injection. The effect in accelerating the prevention of diphtheria by mass immunization is obvious."

It is generally considered by investigators that the effectiveness of precipitated toxoid as an immunizing agent is due to its relative insolubility. This brings about slower absorption and slower excretion, hence less loss of antigen by excretion, and a prolonged antigenic stimulation. Soluble toxoid has been shown to be excreted rapidly, and its stimulus to be transient. Part of the increased effectiveness may also be due to the local damage to the tissues caused by the alum. A small nodule may be felt under the skin in a day or two after administration. This disappears in from three to six weeks.

Since the reports from the Alabama State Board of Health, alum precipitated toxoid has been used in many States and is now in use pretty generally throughout the United States. Since January 1, 1934, it has been used exclusively by the Board of Health of Delaware. Since that time, 2,861 children have been given one dose of the alum-toxoid in Delaware. No Schick testing has been done on this group as yet.

Advantages of alum-toxoid over ordinary toxoid and toxin-antitoxin are, as we see them:

- (1) The probable immunization of a larger percentage of children treated.

- (2) The fact that only one dose is required. In the first place it is easier to get the parents to consent to a child getting one dose than two or three. Then for one reason

or another with toxin-antitoxin or ordinary toxoid we have always had from ten to twenty per cent who did not take the full number of doses.

THE TREATMENT OF PULMONARY TUBERCULOSIS

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After a diagnosis of pulmonary tuberculosis has been made one is confronted with the proper treatment of the case. It might be stated that no two cases of tuberculosis are identical, so that no hard or fast rules are applicable to all cases. However, fairly definite procedures of treatment can be set forth which will apply to each individual case having a certain type and extent of lesion and presenting certain findings. That is, of two patients both having minimal pulmonary tuberculosis, one a young adult, the other advanced in years, one with a positive sputum, the other negative, one showing marked toxemia, the other practically free from toxic symptoms, each will require an entirely different line of treatment.

Tuberculosis being infectious and often acute at the time of onset, it is quite surprising the extent of lung involvement a patient may have on first consulting a physician for the ailment. Therefore, it is by no means true that patients on first visit to a physician are beginning or minimal lesion-type cases; as by the time the lesion has progressed to the point of producing sufficient toxemia to cause the patient to seek medical advice, the majority are found to be in the moderately or far advanced stages of the disease.

Patients are classified by the American Sanatorium Association as follows:

Lesion—MINIMAL (Incipient). Slight lesion limited to a small part of one or both lungs. No serious complications.

MODERATELY ADVANCED. A lesion of one or both lungs, more widely distributed than under "Minimal," the extent of which may vary, according to the severity of the disease, from the equivalent of one-third the volume of one lung to the equivalent of the volume of an entire lung with little or no evidence of

cavity formation. No serious tuberculosis complications.

FAR ADVANCED. A lesion more extensive than under "Moderately Advanced," or definite evidence of marked cavity formation, or serious tuberculosis complications.

Symptoms—A. Slight or None. Slight or constitutional symptoms including particularly gastric or intestinal disturbances or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the 24 hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.

B. Moderate. No marked impairment of function, either local or constitutional.

C. Severe. Marked impairment of function, local or constitutional.

This classification provides for the following groups and sub-groups:

| | |
|-----------|-----------------------|
| Minimal A | Moderately Advanced A |
| Minimal B | Moderately Advanced B |
| Minimal C | Moderately Advanced C |
| | Far Advanced A |
| | Far Advanced B |
| | Far Advanced C |

Before any definite line of treatment can be recommended or given, one must know several things about the patient, such as the type and extent of the lung involvement, whether or not a positive sputum exists, the degree of toxemia, the size and extent of any cavity formation, and other data of somewhat minor significance, as presumable duration of the disease, the age of patient, economic conditions, and any weight fluctuation.

Treatment may be divided into two groups, namely: routine medical, and surgical. However, the proper treatment of each individual patient is sufficient rest of the diseased area to promote healing, whether it be bed rest alone, a surgical procedure, or a combination of both.

Cases can often be grouped accurately at the time the diagnosis is made as to the proper line of treatment to recommend, while others will require a period of observation of the lesion before the future management of the case can be definitely ascertained. Also, the management of each individual patient may change from medical to surgical or vice versa while undergoing treatment.

MEDICAL CASES

Briefly, patients requiring medical management or observation would consist of the following types:

MINIMAL CASES:

Bilateral lesions.

Unilateral lesions which do not appear soft or caseous and presenting few or no symptoms.

However, some physicians recommend immediate collapse therapy on all young adult patients regardless of the extent of the lesion.

MODERATELY ADVANCED CASES:

Bilateral and somewhat similar type lesions in both lung fields.

Unilateral or bilateral lesions which are strand-like in character and show a tendency towards retrogression.

FAR ADVANCED CASES:

Bilateral lesions with cavitations which are so extensive that sufficient lung aeration would not be left after collapse of the diseased areas.

Grave extra-pulmonary complications.

Terminal cases.

SURGICAL CASES

Suitable surgical cases would comprise the following:

MINIMAL CASES:

Unilateral soft or caseous lesions, especially in young adults.

MODERATELY ADVANCED CASES:

Fairly unilateral lesions which show no definite tendency towards healing.

All cavity cases whether unilateral or bilateral.

FAR ADVANCED CASES:

Some form of surgical treatment should be attempted on practically all of these cases if at all feasible, unless the lesions are strand-like in character and no cavities are present. As the late Dr. Barnes of Rhode Island State Sanatorium in a study of over one thousand untreated cavity cases showed an average duration of life of 15.8 months after the diagnosis of cavitation had been made.

Consequently, if at all possible, all cavities must be closed by some form of collapse therapy.

Laryngeal and intestinal complications do

not counter-indicate surgical treatment unless grave.

Medical procedure consists in absolute confinement to bed. However, favorable cases showing slight or no toxemia may be allowed bathroom privileges if the bathroom is not too distant and is located on the same floor level as the patient's room. The length of time of this bed rest will vary greatly depending upon the type and extent of the lesion and will be governed practically entirely by serial X-ray films. The lesion should be retrogressing or becoming strand-like in character before any form of exercise is permitted. Cessation of symptoms does not mean that the patient may be allowed exercise but only signifies a more favorable outlook on the case.

It may be necessary to use some form of medication at times for specific symptoms. However, drugs should be used sparingly and only for a short duration, as their continued use tends to upset the stomach and a more aggravating condition may be caused than the one for which the drug was originally intended. In some cases at times it will be, however, necessary to use a sedative to control the cough or to promote sleep as well as to relieve other distressing symptoms.

Laryngeal lesions respond quite favorably to cauterization.

Intestinal lesions are treated with heliotherapy, cod liver oil and tomato juice, and pneumo-peritoneum; also various combinations of the above. However, for any definite permanent results to be expected or obtained in patients with laryngeal and intestinal complications it is quite imperative that adequate treatment be employed to improve the lung lesions.

The three main surgical procedures are:

Artificial Pneumothorax.

Phrenicectomy (temporary or permanent).

Thoracoplasty.

Also, various combinations of the above.

MINIMAL:

Border-line minimal cases in which a question arises as to whether or not they should be entirely treated medically or some form of surgery employed, will probably do better if a temporary phrenicectomy is performed; thereby giving that lung additional

rest along with the bed rest. The phrenic nerve will regenerate in from four to six months, the diaphragm function again, and the only harm done is a hair-line scar above the clavicle.

MODERATELY ADVANCED AND FAR ADVANCED CASES:

1. Unilateral lesions which appear soft or cavernous.

2. Fairly unilateral cases without soft or caseous lesion in the collateral lung.

3. Bilateral cases with unilateral or bilateral soft or cavernous lesions provided they have not advanced to the terminal stage.

Cases of types No. 1 and 2 are generally best suited for artificial pneumothorax, which if unsuccessful, are followed by phrenicectomy, while a few come to thoracoplasty.

Cases of type No. 3 are suitable for the consideration of a bilateral pneumothorax, or pneumothorax on one side and phrenicectomy on the other. Also, artificial pneumothorax can be supplemented with phrenicectomy, temporary or permanent, on the collapsed side. It might be briefly stated that all patients, in whom sufficient collapse is not obtainable by artificial pneumothorax or phrenicectomy, are suitable cases for the consideration of thoracoplasty.

A PRELIMINARY REPORT OF TUBERCULIN TESTING IN DELAWARE SCHOOLS

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Following the endorsement of a definite outlined tuberculin testing program by the State Medical Society last fall, we have been able to tuberculin test the pupils in seven schools throughout the State, as well as a number of children in our chest clinics.

Only those pupils were tested whose request cards were signed by parent or guardian and by their family physician. Request cards, together with a printed slip explaining the purpose of the test, were given out to the pupils by the school officials. Letters were also sent to the physicians in each community some time before the testing in that community was to be done. No attempt at follow-up of individual cases was made. A response of 40.3% of the total enrollment

in the schools tested was obtained. The response in the individual schools varied from 24.6% to 53.5%.

Patients tested at the chest clinic were those referred by their physicians because of history of contact or because of illness, and those who were members of families known to contain active cases of tuberculosis.

The tests were made with freshly diluted solutions of Old Tuberculin-Intradermal injection of 0.1 cc. of the solution was made on the palmer surface of the forearm. The first

test was made with the equivalent of 0.01 mgm. of Koch's Old Tuberculin. Those who showed no reaction were given a second test with the equivalent of 0.1 mgm. Old Tuberculin. Because of absence from school or because the request cards were not properly filled out at the time of the first test, a small number were given only the single test.

A reaction was considered to be positive if a definite area of edema was present at the site of injection in 48 hours. Reactions were graded as:

TABLE NO. 1

| | School Enrollment | No. Tested | No. Reacted | % Reacted | No. X-Rayed | X-RAY FINDINGS | | | | |
|-----------------------------|-------------------|------------|-------------|-----------|-------------|---------------------|-------------------------|-------------------|--------------------------|----------|
| | | | | | | No. Positive X-Rays | Tracheo-Bronchial Nodes | Pulmonary Nodules | Childhood Lesions Stable | Unstable |
| Routine Clinics | | 23 | 38 | 38.3+ | 33 | 8 | 4 | 1 | 1 | 2 |
| New Castle | | | | | | | | | | |
| Wm. Penn School | 600 | 148 | 68 | 45.9+ | 31 | 11 | 5 | 4 | | 2 |
| New Castle | | | | | | | | | | |
| Buttonwood School | 45 | 22 | 7 | 31.8 | 2 | 1 | | | | 1 |
| New Castle | | | | | | | | | | |
| Booker T. Washington School | 75 | 34 | 17 | 50 | 12 | 3 | 1 | 3 | | |
| Dover | | | | | | | | | | |
| White | 1072 | 430 | 137 | 31.6 | 115 | 43 | 21 | 19 | 3 | |
| Dover | | | | | | | | | | |
| Colored | 308 | 165 | 46 | 21.2 | 39 | 14 | 9 | 3 | 1 | 1 |
| Selbyville | | | | | | | | | | |
| White | 277 | 140 | 27 | 19.2 | 26 | 6 | 2 | 4 | | |
| Laurel | | | | | | | | | | |
| White | 953 | 406 | 76 | 18.7 | 40 | 27 | 19 | 6 | 1 | 1 |
| Total | 3330 | 1444 | 416 | 28.8+ | 298 | 113 | 61 | 39 | 6 | 7 |

(1) One plus if the edema was less than 10 mm. in diameter.

(2) Two plus if the edema was between 10 mm. and 15 mm. in diameter.

(3) Three plus if the edema was more than 15 mm. in diameter, but without necrosis.

(4) Four plus if an area of necrosis was present.

If the reaction to the first dilution was questionable it was considered negative and the test was repeated with the second dilution. While a record of the degree of reaction for each individual has been kept, in grouping the results of testing reactions have been listed as either positive or negative.

In so far as possible all pupils giving a positive reaction were referred for x-ray. Many of the reactors who were unable to afford a roentgenologist were x-rayed at Brandywine Sanatorium. Others were referred elsewhere by their physicians. As reports have not been received from all the x-rays taken elsewhere, only results of those

taken at the Sanatorium will be included in this report.

Table No. 1 includes a resume of the results of testing and x-ray findings in the various schools and also in the routine clinics. It will be noted that the percentage of positive reactors varies from as low as 18.7% in the Laurel School, to as high as 50% in one of the New Castle schools. In Dover and New Castle, the two communities in which both white and colored pupils were tested, the percentage of reactors of the two races in each community more closely resemble each other than do those of the same race in different communities.

Table No. 2 shows the results of testing and x-ray study grouped according to age and sex of individuals tested; and also according to history of contact or non-contact with tuberculous infection. From a study of these tables we find that the percentage of reactors among contact cases is 54.8% as compared with a percentage of 27% for the non-contact group. Since all pupils whose

cards lacked information as to history of contact were placed in the non-contact group, it is possible that some of the posi-

munities visited. The results obtained represent, of course, only a section of each group tested; and, while they indicate the percent-

TABLE NO. 2

| Age Tested | Sex | CONTACTS | | | NON-CONTACTS | | |
|------------|-----|------------|-------------|-----------|-------------------|-------------|-------------------|
| | | No. Tested | No. Reacted | % Reacted | CHILDHOOD LESIONS | | CHILDHOOD LESIONS |
| | | | | | No. Tested | No. Reacted | |
| | | | | | No. X-Ray | | |
| | | | | | Stable | Unstable | |
| Under | M | 20 | 7 | | | | |
| 6 | F | 22 | 9 | 38% | | | |
| | M | 58 | 12 | | | | |
| 6 | F | 40 | 5 | 17.3% | | | |
| | M | 51 | 9 | | | | |
| 7 | F | 48 | 6 | 15.1% | | | |
| | M | 55 | 14 | | | | |
| 8 | F | 64 | 10 | 20.1% | | | |
| | M | 70 | 19 | | | | |
| 9 | F | 64 | 13 | 23.8% | | | |
| | M | 70 | 12 | | | | |
| 10 | F | 75 | 18 | 20.6% | | | |
| | M | 62 | 18 | | | | |
| 11 | F | 71 | 18 | 27% | | | |
| | M | 65 | 20 | | | | |
| 12 | F | 94 | 31 | 32% | | | |
| | M | 69 | 24 | | | | |
| 13 | F | 68 | 23 | 34.3% | | | |
| | M | 59 | 21 | | | | |
| 14 | F | 78 | 21 | 30.6% | | | |
| | M | 37 | 13 | | | | |
| 15 | F | 55 | 23 | 39.1% | | | |
| | M | 33 | 17 | | | | |
| 16 | F | 35 | 10 | 39.7% | | | |
| Over | M | 36 | 18 | | | | |
| 16 | F | 45 | 25 | 53% | | | |
| Total | | 1444 | 416 | 28.8% | 126 | 69 | 53 |

tive reactors in the latter group are really contact cases. Five, or 3.9% of 126 contact cases tested, and 2, or 0.15% of 1318 non-contact cases tested showed presumable lesions requiring treatment, on x-ray study.

Of the 759 females tested, 212 or 27.9% had positive reactions.

Of the 685 males tested, 204 or 29.7% had positive reactions.

90 patients reacted to 0.1 mgm. O. T. after failing to react to 0.01 mgm. 22 members of this group showed demonstrable lesions on x-ray but in each case these were either calcified pulmonary nodules or calcified tracheobronchial lymph nodes, all representing apparently healed lesions.

COMMENT

As this work has only been carried on during the past few months, a response of 40.3% of the total enrollment of schools tested is a rather gratifying indication of interest on the part of physicians and parents in the com-

munity visited. The results obtained represent, of course, only a section of each group tested; and, while they indicate the percent-

age of reactors and of lesions demonstrable by chest x-ray in each group of children, they cannot be taken as definite figures for the entire school group in the community. The number tested is too small as yet to permit any definite conclusions. It is interesting, however, to note the variation in percentage of reactors in different communities—the similarity in percentage of two races in one community—the similarity between reaction of male and female pupils—and the large percentage of positive x-ray findings among contact cases as compared with those among non-contact cases.

It is also interesting to speculate as to whether a larger number of children could not be satisfactorily tested by including all contacts, and only the older children in the non-contact group; and, possibly, by using only the single test dose of 0.01 mgm. Old Tuberculin.

THE VALUE OF PRENATAL CARE DURING PREGNANCY

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What is prenatal care, in so far as it relates to the toxemias of pregnancy? It is a system by which the patient is seen and examined at regular intervals throughout pregnancy, and at each examination a diligent search made for a beginning or early toxemia.

During the past decade great strides have been made in the prenatal care given to expectant mothers. In certain localities in this country it has been demonstrated that a very large percentage, probably half, of the mothers and babies who die annually could be saved by proper obstetrical supervision and care during pregnancy and labor. In none of the abnormalities of pregnancy has prenatal care proven as effective as in the toxemias. Eclampsia has been reduced by careful antenatal supervision, and by the same means many women suffering from damaged kidneys have been enabled to live a longer and more useful life.

Today most maternity hospitals are conducting prenatal clinics, and even in many small villages, where no hospital facilities are available, the need of prenatal care is known, with the result that prenatal clinics are conducted by the State or county medical societies. This is indeed proof that the country is realizing the value of these preventive measures.

The toxemias of pregnancy account for approximately one-quarter of the total maternal mortality incident to childbirth. When we consider the effect of pregnancy on an underlying chronic nephritis we find the toxemias responsible for almost one-half the maternal deaths incident to childbirth. It has been estimated that more than 25,000 women die each year in the United States as a result of the immediate and remote effects of pregnancy. Of this number it is safe to assume that one-third are due to the effects of the toxemias of pregnancy.

The fetal mortality due to the toxemias is even greater. Eclampsia alone accounts for a fetal mortality of over 30 per cent. In the nephritis of pregnancy the fetal mortality is

almost as high. The fetal mortality in the United States is close to 100,000 a year.

Fortunately, the various types of toxemia are associated with symptoms and findings that can act as danger signals if seen early and properly interpreted. It is the purpose of prenatal care to observe these danger signals as soon as they appear, to properly interpret them, and to institute the proper treatment.

In order that a system of prenatal care may be able to accomplish these aims, it must involve a routine examination of the patient every three weeks from the time that the first period is missed up to the end of the seventh month, and every two weeks thereafter until the end of pregnancy. The findings of these examinations must be recorded accurately in order that they may be properly interpreted. This is necessary in all maternity clinics, also in the private office of every physician who takes care of pregnant women. At each examination the weight is noted, the blood pressure taken, and the urine examined for albumen and casts. The patient is questioned as to any symptoms that may lead to the discovery of toxemia, such as headaches, visual disturbances, epigastric pain, and feeling of dizziness. At each visit it is the duty of the physician to see whether or not there is any edema, especially of the extremities. Should the patient complain of any visual disturbances, it is the duty of the obstetrician either to examine her eye grounds himself, or have this done by an ophthalmologist.

There are four types of toxemias which may occur during pregnancy and which can be recognized early by conscientious prenatal supervision, viz: vomiting of pregnancy, low reserve kidney, nephritis, and eclampsia.

Vomiting of pregnancy is usually easy to recognize and usually occurs during the first third of pregnancy, and the patient herself is aware of the disease. Many of these cases are cured by suggestive treatment, as well as by changing the dietary habits of the patient. Only a small percentage of the women suffering from vomiting of pregnancy who are given the proper prenatal care find it necessary to enter a hospital for treatment. Prenatal care is one of the most valuable aids in not only the prevention but also the cure of vomiting of pregnancy.

Low reserve kidney and eclampsia, with its forerunner, pre-eclampsia, occur in the latter half of pregnancy. Nephritis complicating pregnancy may be seen very early in the period of gravidity. It, therefore, becomes necessary that the patient be examined routinely from the beginning of pregnancy until term.

It is only by a careful recording of her blood pressure, urinary findings, presence or absence of edema, that we are able to recognize early any one of these types of toxemia. As soon as hypertension or albuminuria is noted the examination of the patient should be even more thorough. The whole purpose of prenatal care in these types of toxemia is to enable us to recognize them as early as possible and then to institute proper treatment.

This is the mildest type of toxemia. It manifests itself during the last three months of pregnancy and is characterized by a slight hypertension, rarely exceeding 150 systolic and 90 diastolic, and albuminuria which is never very great. This type of toxemia is not associated with marked edema, eye changes, epigastric pain, or severe headache. The outstanding characteristic of this type is that in subsequent pregnancies the patient's condition does not become aggravated, as in chronic nephritis or any other type of nephritis. The essential aim of prenatal care, so far as this type of toxemia is concerned, is to recognize it and to differentiate it clearly from nephritis. It is advisable to regard chronic nephritis, or any other of the nephritides, in a pregnant person as a toxemia, because it is essential to distinguish between nephritis and the other types of toxemia.

Pregnancy occurring in a woman suffering from an underlying nephritis undoubtedly shortens her expectant duration of life by a large margin. If medical care is to be of any assistance to these patients it is essential that the underlying nephritis be recognized as early as possible and the proper treatment instituted. Sometimes it is possible to establish a definite diagnosis of nephritis during the first month of pregnancy, for the reason that pregnancy itself is the best of all known kidney function tests. Should hypertension, albuminuria, edema, or any symptoms such as headache and visual disturbances appear

during the early weeks of pregnancy, the prognosis is grave, as the condition is undoubtedly one of permanent kidney or Bright's disease. Certainly all such patients should be regarded as nephritic until proven otherwise. When these findings and symptoms appear later in pregnancy, it is essential that the patient be brought into a hospital in order that proper kidney function tests be performed and the correct diagnosis established. With a thorough study of the patient's past history, the response of her hypertension, albuminuria, edema and symptoms to a ten-days or longer of complete rest in bed and proper diet, together with blood and urine chemical analysis and kidney function tests, one can readily recognize nephritis in over 80 per cent of those suffering from it. In the remaining 20 per cent it may take much longer and more detailed study.

It must be pointed out that a single kidney function test is not of much value; it is necessary to have repeated tests before one can rely implicitly on these tests. A repeated urea clearance of below 50 per cent is almost sure proof of an underlying nephritis.

It must be clear from the foregoing evidence that a complete clinical study of the patient, her response to rest in bed, and a careful study in the hospital of her kidney function, her blood and urine chemistry, her eye ground findings, and her hypertension and albuminuria are essential before a definite diagnosis can be made.

It is the function of prenatal care to detect as early in pregnancy as possible those patients suspected of having a nephritis and thus to enable us to hospitalize such patients for the study essential to an accurate diagnosis. When once the diagnosis of nephritis in any form is firmly established the treatment in the majority of cases should be termination of pregnancy, with avoidance of further pregnancy. By careful and routine examination of the patient throughout pregnancy we can detect early and mild nephritis, and then treat her along the lines indicated, thus adding materially to her span of life.

ECLAMPSIA AND PRE-ECLAMPSIA

During the past fifteen years proper prenatal care has reduced remarkably the number of cases of eclampsia and pre-eclampsia. In a

statistical study Rice has shown that with the help of adequate ante-natal care the number of eclampsias decreased from 1 in 200 to 1 in 652 deliveries in maternal hospitals. This has been the experience of most hospitals. The frequent routine estimation of the patient's blood pressure, urine analysis, and her general condition leads to an early recognition of pre-eclampsia or impending eclampsia, and so enables the physician to institute means to prevent eclampsia. Under these circumstances, as in nephritis, the patient must be admitted to a hospital as soon as signs or symptoms of a pre-eclampsia appear.

It must be evident that the function of adequate prenatal care is not to differentiate accurately between these three types of toxemia: low kidney, toxemia, and eclampsia (with its forerunner, pre-eclampsia) in the antenatal clinic or in the private office, but its sole purpose is to enable the doctor to know at the earliest possible moment that his patient has a beginning hypertension, an albuminuria, an edema, or some symptom as headache, epigastric pain or visual disturbance, and so enable him either to watch her more closely or to bring her into a hospital for proper study and treatment. In this way, then, good prenatal care makes it possible for the doctor to materially reduce his maternal and fetal mortality.

VITAL STATISTICS: WHY?

JOHN R. DOWNES, M. D.

Newark, Del.

The apparent misconception of the duty of those charged with the accurate and complete reporting of data relative to records of birth, deaths, and disease, as applying to physicians, midwives and parents, and the local and State registrars of such reports, together with the appalling lack of correctness in information given on certificates of birth and death and on reports of morbidity, also the enormous amount of work entailed in an effort to subsequently straighten out his information (being on the receiving end of a mass of incorrect and inaccurate reports of births, deaths and morbidity) prompts me to try to give a few of the personal (to you and me) reasons why physicians should make an effort

to arouse themselves from the state of lethargy now prevailing in our mutual relations.

After reference to the works of Pearl and Whipple on the subject of vital statistics, I found that the correct compilation of these statistics, has a much more far reaching effect upon our industrial, economic and social life than a glance would reveal: The following brief definition of the words, by Webster, is short and to the point.

VITAL: Belonging to or contributing to life; important to life; essential.

STATISTICS: Collection of facts and figures regarding the condition of people, class, etc.

WHY: For what cause or reason.

In the early part of the nineteenth century, it became apparent that this country was far behind the countries of Europe in the proper compilation of vital data; and it was becoming more obvious all the time and is now being well recognized that the maintenance of accurate records of vital statistics is a proper governmental function, and that no nation, State or city can be considered as having a complete governmental equipment which does not provide for the proper collection and permanent recording of such statistics.

The national value of such records is reflected in being able to take stock of our vital capital, of the gains and losses by birth and immigration, and by death and emigration, our national wealth being more secure in healthy, happy men, women and children, than in our lands, forests, mines, herds or dollars. The above being accepted as a fact, steps have been taken from time to time to promulgate rules and regulations for the better collecting and recording of our vital data, which brings us to the present day birth, death, marriage and morbidity reports, with which every physician is familiar; every item of information requested on these reports is important in order to bring and keep up to date our national vital bookkeeping, and should be given, so far as possible, earnest consideration.

Accurate birth report information is of local importance because: It is the law of the State that every birth shall be registered; it is necessary to prove age and citizenship; it gives the right to go to school, to start to

work, to marry, to inherit property, to hold public office, to secure passport for foreign travel, to secure widow's pension, to enter army or navy, and, in respect of a dependent child, to receive State aid; it enables one to prove right to a definite insurance rate, to prove legitimacy, to enter a profession, to enter the civil service, to make contracts, and to receive pension.

Our neighboring jurisdictions are very persistent in their determination to have every birth reported. (In Pennsylvania if a birth is not reported in ten days an affidavit is required to accompany the certificate, setting forth the reason for the delay).

The general public is becoming more aware of the value of birth registration, and is demanding the certificates. Every month we have numerous requests for records of registration and if these are not already recorded much more trouble is caused the physician. It is easier to report promptly than to delay and later be pestered. If care is exercised in securing the information much time and annoyance will be saved. If, for instance, a report is sent in with a wrong date, the wrong maiden name of mother, or the wrong name of child, it is registered as sent in, and becomes a permanent official record, and the registrar cannot make any changes in the original except when requested over the signature of the reporting party. Legibility is also important in order to save future annoyance.

The morbidity report is another item worthy of consideration, as the efficiency of whatever control measures are recommended depends upon an early report of the disease. This is especially true of typhoid fever, as we all know control steps often prevent many secondary cases of this disease.

PUBLIC WORKS AND PUBLIC HEALTH AN OPPORTUNITY FOR THE MEDICAL PROFESSION

RICHARD C. BECKETT, B. S.
Dover, Del.

A cursory glance at conditions in Delaware brings out fairly clearly two things; one, that the per capita contribution of taxes to the Federal Government is exceeded by only twelve States in the Union; two, that the

State debt per capita is the lowest of any State in the Union.

All of this has occurred despite the notable advances that have been made in highway construction and school construction in this State. In the not far distant future both of these programs, as far as new construction is concerned, will be nearly completed. Since these primary needs of an advanced civilization are being adequately met in this State, and almost completely so within a few years, it would seem that the time has come to reorient the viewpoint of the people of this State along different lines, notably "sanitation" and "housing."

Considerable strides have been made in sanitation over the past ten years in this State, and right now the towns of Harrington and Elsmere are constructing sewerage systems, and also intermittent laying of sewers is occurring in the urban areas just outside of Wilmington.

Most of the unsanitary conditions that come to the attention of the Division of Sanitation are within a radius of about twelve miles from the city of Wilmington, and which might be called the metropolitan area of Wilmington. This is due to the fact that the people moving out from Wilmington want the modern conveniences of water and sewerage facilities but bump up against the problem of taking care of their sewage problems in a soil that is not adapted to cesspools. To relieve this condition the Levy Court had passed a bill permitting them to construct sewerage systems in rural New Castle, to be financed out of county or road taxes in that area, and which was a bill that took the place of a Sanitary District bill advocated by the writer in 1927.

A considerable amount of work has been done, not all of it as well planned as it might be, due to various factors, but the chief deterrent has been the establishment of an assessment of \$2.50 per front foot. This is, from a bookkeeping standpoint, an easy solution, but is not a scientific solution of the problem of financing sewerage systems. Our best guide in such practices is to take the experiences of municipalities and sanitary districts which have been established for years in other State. The county law should be

amended so that the Levy Court may establish sanitary districts irrespective of political boundaries but determined solely by the natural drainage areas as outlined by the topographical survey. All of the people included in this topographical area, or natural drainage district, have the same interests in public health and sanitation as do the people within the boundaries of an incorporated town or city. If the above assumption is correct, the law should be changed as indicated, giving the Levy Court further power to bond those districts for the cost of sewage treatment plants, outfall sewers, the sewers at the intersections of streets, manholes, and the cost differential between any pipe larger than an 8-inch pipe. These costs which are assumed by a bond issue and could be paid for over a period of time, should be financed as a community, with a direct cost only to the property owner of an 8-inch pipe in front of his property. That is all the individual needs to take care of his sewage, and all of the extra costs over and above that should be borne by the people living in that topographical area. This solution may require a few more book-keeping entries, but, to my mind, is certainly a much more equitable solution. Why should a citizen living in a topographical area, favored by nature, in which an outlet into a large body of water is available, thus obviating the cost of a sewage treatment plant, be saddled with the same front foot assessment as those citizens living in an area where entirely different conditions prevail? The main argument, as I see it, is that if you can keep the cost of sewers down per property you are going to encourage more connections to the sewerage systems which have been built, and, moreover, the governing unit will have its financial outlay returned in a shorter period.

In addition to the above, since the Levy Court has the power to construct sewerage systems, they should also have the power to enforce connections, the same as any municipal corporation has by ordinance.

The subject of housing has been recognized by the State through the passage of a law at the last Legislature creating a State Housing Commission which has just recently issued its 1934 report, which includes surveys of Dover, Newark, Milford, Georgetown and

Laurel. The surveys indicate fairly accurately the conditions prevailing in these towns, although the pride of some of the people who live in the better portion of the towns may be somewhat hurt by the reports. The further development of housing in this State, as I understand it, depends on the encouragement of private capital in this field of investment. It is to be hoped that when such work is done that the power to condemn will be used so that these congested areas will be totally destroyed, converted into playgrounds and parks, and the displaced dwellers settled in far more enjoyable locations. This also has its sanitary aspects, and it should be kept uppermost in every housing project.

A survey of the sanitary conditions throughout the State reveals that practically every sizable community has a satisfactory public water supply and that a considerable amount of construction is now going on in that line. For instance, the Artesian Water Company, a recently organized private company, has extended its operations through Richardson Park, Elsmere, Tuxedo Park, and all of that area lying west of Wilmington; the Wilmington Suburban Water Company, a still more recent creation, is now actively supplying a satisfactory water supply to Bellefonte, Holly Oak, Hillcrest, and as far north as Claymont, which latter area has been receiving Chester city water which is occasion of many complaints, due to odors and tastes in the water, which in turn are due to the prevalence of phenol compounds coming from the oil companies situated on the Delaware.

In addition to the above, Frankford is constructing a water supply system and Selbyville is making arrangements to remove the objectionable carbon dioxide content of its water. There are not many sizable towns left in Delaware in which public water supplies could be built and justified economically.

The same does not apply, however, to several of the towns which are of sufficient size to justify a water-borne system of sewers. This is particularly true of towns such as Middletown, Rehoboth, Georgetown and Milton. Public improvements here might be helped if the State would do some part in

granting aid to these various towns. This aid might be in the form of providing the cost of sewage treatment plants on the basis that it will encourage construction work in this State of a permanent value which the citizens can enjoy for generations, and also from the standpoint that irrespective of where a person may live we all have an interest in the maintaining of clean streams in this State. This is not only an aesthetic objection but also, in certain cases, it is objectionable because it does deprive the State of certain natural resources and also deprives a certain number of people of gainful employment. I refer particularly to the pollution of St. Jones Creek by the city of Dover, which affects the oyster beds in the mouth of the creek; to the city of Milford, whose pollution in turn destroys the oyster beds in the Mispillion Creek; and to Lewes and Milton, whose sewage is responsible for the condemnation of the oysters in Broadkill Creek. These are conditions which might be remedied by State aid, and I think could be justified on the above grounds from a State viewpoint.

The city of Dover will probably go ahead on their progress of installing a sewage treatment plant in the next five years, but undoubtedly would begin much earlier with State aid. The problem at Milford is of considerable magnitude, due to the haphazard planning of the sewerage system over a period of years, and for which no one in particular is to blame. The town of Lewes can very readily install a sewage treatment plant, although the agitation for a new inlet into the Canal would probably solve their problem.

In addition to the purely municipal and suburban projects which have been outlined above there is a considerable amount of actual State work that could be done if the State saw fit to appropriate the necessary money. I refer particularly to Stockley Colony, where both a water system for convenience and fire protection is very much needed, as well as a complete sewerage system, as conditions there now are quite primitive compared with the other State institutions. Brandywine Sanatorium is in need of additional sewage treatment facilities, as is also the Colored College located north of

Dover, where the sewage from this institution is having only primary treatment in the settling tank, plus chlorination. This should be increased so that secondary treatment on sand filters might be provided and thus the effluent from this, plus chlorination, would be of a quality, at least, equal to the water into which it is being discharged. At the present time the effluent is heavily chlorinated and probably safe, but that does not do away with the aesthetic objection of having the partially treated sewage going into a lake which is used by a considerable number of people in Dover. Added sewage treatment facilities are also needed at the Industrial School for Girls at Claymont.

Another program on which a start has been made in this State, and a very commendable start, is the program for the elimination of mosquitoes. This is not only a problem of the health and comfort of 230,000 people, plus what visitors come into the State, but it is an economic problem also. This is attested by the information unearthed by the Mosquito Control Commission, through the work of Mr. W. S. Corkran, in which definite statements have been made by parties on whose land this work has been done. Many were opposed to this work but have been won over after finding out that their preconceived ideas were mostly prejudices. This information indicates that the production of milk has increased, that more land is available for farming and of good quality soil, and, further, that the production of salt marsh hay has increased. Efforts are being made by the Mosquito Control Commission to find markets for such hay and thus increase its marketable value. The elimination of mosquitoes will more than pay for itself in these various increments of value in addition to the rise in real estate values which will be occasioned by such an improvement. Any money invested by this State will, in the future, be amply repaid, although the book-keeping which will show this may be a little complicated, as it is difficult to figure in dollars and cents the value of mosquito control work, public highways, or public schools. Many of these benefits which might be classed as intangibles cannot be weighed in terms of grams or ounces, but all add to the enjoy-

ment of that period of life on this earth which the Metropolitan Life Insurance Company estimates to be somewhere around 65 years per person and still increasing.

In order to compare the cost of mosquito control work with work that has been done in this State, it might be said that the cost of three miles of concrete highway per year, or the cost of one ten-room school per year, for the period of six years would make the mosquito problem of this State negligible.

To sum up it would seem that there are possibilities looking forward to the next Legislature for some tangible work to be done along the lines of sanitation, housing, and mosquito control work, provided the people of this State, as well as the members of the medical profession, can be aroused to the desirability of such projects. Such tangible improvements will result in more improved housing conditions in this State, better sanitary facilities and will return dividends that are of actual value in health, happiness, and convenience. Undoubtedly the trend throughout the country and the marked emphasis which the Federal departments have put on just these very fundamentals are going to raise the standards of living in this country far beyond any that might result from what we call haphazard individualism.

Certainly democracy does not mean only freedom of speech but means decent living conditions and decent sanitary conditions. Not only will such tangible improvements affect the people of this generation but will also affect the coming generation and will add its quota to bringing up a cleaner and sturdier young America.

I might add in closing an excellent editorial by Mr. Abel Wolman, chief engineer of the State Board of Health of Maryland, chief engineer of the Public Works Act of the State of Maryland, and editor of Municipal Sanitation:

PUBLIC HEALTH AND RELIEF FUNDS

"An observer on Mars would have some difficulty in reconciling the democratic emphasis on "rugged individualism" in the

United States with the monarchist emphasis on communal responsibility in England. In our own country we move slowly in the direction of the "debilitating influence of governmental subsidy," even when private initiative, as in housing, has failed miserably to provide a large part of our citizens with decent shelter.

A review of the most recent report of the Ministry of Health of England would startle the strongly individualistic citizen of our democracy. The contrast in policy, with respect to community problems, in this monarchy, across the Atlantic should give us food for thought.

Recent statistical reports in the United States indicate an increase in typhoid fever, essentially of rural distribution. In many instances, its origin is in defective rural water supplies. Extension of well-controlled public facilities into nearby rural areas is not an impossible or fantastic task. Its financial implications, however, run counter to orthodox utility extension policy. We rest, therefore, upon our oars until the areas grow self-supporting!

In generalized health work, some of the areas will never become self-supporting. Shall we there let these people die or shall we be our brothers' keepers?

Last year, the Ministry of Health of England sanctioned about five million dollars in unemployment grants for extending public water supplies into rural areas. In housing subsidies, approximately sixty million dollars were granted to local areas by the Federal Government in one year. Since 1919 it has distributed for similar purposes over three billion dollars.

There, as here, the century-old cry of "paternalism" frequently conceals a prejudice against decent living for the "underprivileged." We must adjust our viewpoints, however, on the necessity of affording each person with minimum standards of health and comfort, even where the only available method is through community financing by the central government."

EDITORIAL

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EVOLUTION AND MEDICINE

One of the charges which for years have been leveled at the medical profession, though possibly more especially at that section of it which engages itself with public health activities, is, that of all whose doings tend to affect human destiny they are most active in endeavoring to disturb nature's way of making those advances which constitute evolutionary progress.

We have on many occasions made use of our medical knowledge and ability in order to save the lives of sub-standard infants, who under nature's plan, would be doomed to perish. We have given our children antitoxin to combat infections and have saved their lives. Nature would have permitted

them to contract these diseases, and even, since Rachel wept for her children, might have deemed the loss regrettable. If, however, the child did not die, it was because it had manufactured its own antitoxin, and by reason of having done so, its descendants might be less likely to have it, when they, a score or more years later, became exposed. Thus would be built up racial immunity, an evolutionary possession, vastly superior, the critics state, to that induced by treatment. We are preventing the early deaths of our diabetics, and these are now producing offspring more likely themselves to be diabetics in accordance with accepted Mendelian laws. Nature would have permitted these to die before they had transmitted to others the diabetic tendency. And reprehensible, in all conscience, though our actions have been from the point of view of physical development, when we consider our shortcomings in respect to mental development we ought to be, if we are not, appalled.

The arguments seem unanswerable, nor is it the purpose of this editorial to advance any refutation. The statement that revelation superseded evolution seems specious, flavored by an arrogance perhaps to be expected from one of the lords of creation. But this does not mean that there are no refutations. That eminent exponent of evolutionary practice, the Spartan race, which exposed its weakling infants to perish, was submerged as rapidly and as completely as were others exhibiting a less advanced philosophy though some more humane tendencies. And if, in former stages of development, there were persons who could surpass in almost any line of endeavor some of the present generation they were not very numerous. A William Shakespeare possibly, and a contractor ready to undertake under old conditions the construction of the pyramid at Ghizeh.

It is doubtful if the bravery, endurance and constancy under suffering exhibited by individuals or groups in the World War

would not parallel any before experienced at any time or in any place.

If records mean anything the present-day athlete surpasses those of former years. Einstein might not have to take much of Newton's dust. Though Methuselah lived long, he did not appear to have done much, and Turk of modern times has about taken Parr's measurement. Certainly there can be no question insofar as is concerned the length of life of the average individual of today, since in all civilized countries he lives at least twice, possibly three times as long as did most of his forbears.

A REALLY SERIOUS SITUATION

For the second time in the past three years the State of Delaware reports an increase in the rate of tuberculosis mortality.

In the year 1931 the rate exceeded that of the former year. In 1932 there was a small improvement in the figure. In the year 1933 there was again an elevation in the rate. In this year (1933) only five States in the entire Union report increases. The Delaware rate is nearly fifty per cent higher than is the rate of the United States as a whole. Only ten States have rates higher than has Delaware.

For the past five years there has been little improvement shown in our tuberculosis losses. Previous to that each year evidenced a decline—often a marked decline—over the figure of the former year, the trend thus satisfactorily dropping. Had the rate of improvement been maintained the Delaware rate would now closely approximate the rate of the registration area of the United States.

Nor is the reporting of the disease in Delaware on a satisfactory basis. There is only about one new case of the disease reported for each annual death. A number of the States report two or three cases. There are only sixteen States in which the ratio is lower than is Delaware's.

The seriousness of the situation arises from the fact that the improvement which was being made has been arrested. Is it because the limit which can be obtained by the methods then used has been reached? It seems so, and

that there must be additional effort along a different line before lower figures can be expected. **Is that line not the provision of hospital beds?**

We know there is a crying need in the State for beds at the sanatoria: The lengthy waiting lists prove that. Many cases are removed from the waiting list by death before comes their opportunity of getting treatment. Persons requiring treatment must often wait months before admission. Some who can then be admitted have in the interval so progressed that little or nothing can be done for them, though had hospital treatment been possible when they first came under observation they might have been saved.

And, in the meantime, the infection of the general population is going on from those who ought to be under hospital care, and removed from the possibility of infecting others.

For how long must this condition continue?

At this moment there are probably a thousand cases of the disease in the State. There is hospital accommodation for fewer than two hundred. The remainder are scattered in the homes of the State, where others are being infected, themselves soon to be victims.

What else but this infection in the home can be blamed for the increase of the disease?

American Congress of Physical Therapy—Alfred F. Tyler, M. D., Omaha, President; William L. Clark, M. D., Philadelphia, President-elect; Nathan H. Polmer, M. D., New Orleans, Secretary; John Stanley Coulter, M. D., Chicago, Treasurer; Marion G. Smith, B. S., Executive Secretary. The thirteenth annual session of the American Congress of Physical Therapy will convene at the Bellevue Stratford, Philadelphia, September 10, 11, 12 and 13, 1934. September 14 will be devoted to hospital clinics, detailed announcements of which will be made by printed bulletin not later than September 13. Every member and guest, including the ladies, must register at the registration desk as soon as they enter the convention quarters. Attendants will be present at the entrances of all

meeting rooms and admission will be strictly by badge. The official publication is the *Archives of Physical Therapy, X-Ray Radium*, of which Disraeli Kobak, M. D., Chicago, is the editor, and A. R. Hollender, M. D., Chicago, the managing editor.

Menstrual Edema: Preliminary Report

J. Shirley Sweeney, Dallas, Texas (*Journal A. M. A.*, July 28, 1934) records the weight of forty-two normal, healthy young women before, during and after menstruation. Approximately 30 per cent of these women showed a gain of 3 or more pounds sometime during the menstrual cycle, usually just before the period was established. Other cases showed a true pitting edema. This phenomenon may be due to some endocrine disorder or disturbance of the sympathetic nervous system rather than to changes in the blood constituents or to renal insufficiency.

OBITUARY

PETER W. TOMLINSON, M. D.

Dr. Peter W. Tomlinson, one of Wilmington's oldest physicians, died in the Beebe Hospital, Lewes, on July 25, 1934, following a brief attack of pneumonia, at the age of 84 years.

Dr. Tomlinson was born in November, 1849, at Jones Neck, Kent county, on a farm which was formerly owned by the Hon. John Dickinson, of Colonial renown and founder of Dickinson College. He was the son of James and Rachel Saulsbury, nee Wilson, Tomlinson, a descendant of Thomas Tomlinson, of Revolutionary fame, who after serving in the Revolution was elected to the Legislature. His forebears had been agriculturists, and Dr. Tomlinson was the first of his family to follow a profession.

After attending the public schools he attended Jefferson Medical College and was graduated from that college in 1878. After his graduation Dr. Tomlinson went to Milton, Sussex county, where he practiced for five years. While in Milton he was elected to the

General Assembly. Also, he married Miss Virginia C. Hazzard, who died several years ago.

On coming to Wilmington Dr. Tomlinson lived at Seventh and West streets, where he built up an extensive practice. A few years ago he removed to Park Place and Van Buren street, where he had an office with his son, and only child, Dr. Robert W. Tomlinson. He retired from active practice in 1930.

During his medical career, Dr. Tomlinson served as both president and secretary of the Medical Society of Delaware. A past president of the State Medical Examining Board, and for years had been medical director of the Continental American Life Insurance Company, he was made medical director emeritus after his retirement.

He was a member of the national, state and county medical societies, of the Masonic fraternity, and until recently a member of the Wilmington Club. He was an active member of Grace M. E. Church.

When he had been practicing for fifty years a dinner was given in his honor by the Medical Society.

His recipe for long life and success was "Moderation in preference to excess, on all occasions." He believed in the good that could be done by a general practitioner, and thought too much specialization harmful.

Funeral services were held on July 27th at St. George's Episcopal Chapel, between Millsboro and Rehoboth. By special request his body was cremated and the Episcopal services were held over the ashes, with Rt. Rev. Philip Cook, bishop of the Episcopal Diocese of Delaware, officiating. Bishop Cook was assisted by Rev. B. M. Johns, D. D., pastor of Grace M. E. Church. Interment was in the adjoining cemetery in St. George's, beside the grave of his wife. Dr. Tomlinson's father and mother are also buried there.

In the death of Dr. Tomlinson the medical profession of Delaware has lost one of its most beloved physicians and one of its noblest characters.



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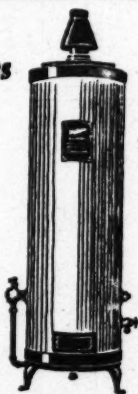
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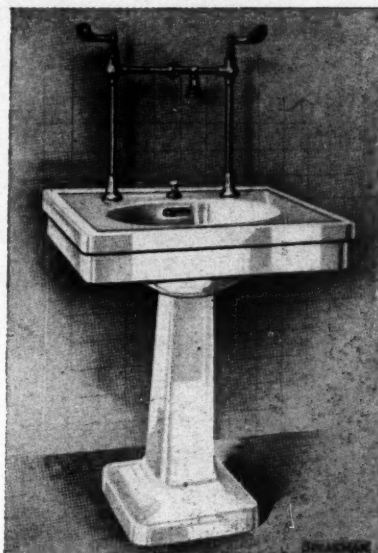
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